

# A Study on Proactive Environmental Health and Safety Management System in Construction Industries

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## Abstract

*In India construction industries has travelled a long distance in short period of time. construction project are dynamic they are characterized by many factors such as frequent work team rotation, exposure to weather condition, high proportion of unskilled and temporary workers. This research mainly aims at providing a safety & healthy job atmosphere for all employees to do their work and responsibilities and by minimizing impact of accidents. Hence it develops a work environment where continual improvements and learning from all accidents and mistakes.*

**Keywords** — *Safe and Healthy work atmosphere, Measures to control, Risk and Hazards.*

## I. INTRODUCTION

The construction industries is unique among other industries as the activities of construction often take place in the outdoor under conditions not conducive for safety and health workers in the construction site have to face constant change in the nature of work, the location of work and the mix of work.

### A. Accident, Safety and Culture

Nowadays safety and quality are main issues in construction industries. ISO 9000 has been implemented in construction industries to assume the quality of construction. Apart from quality, safe working environment is very necessary. Revolution and changes in environmental, health and safety management system has become as a mandate in practicing safety action.

The safety culture of an organisation is the product of individual and group values, attitudes, perception, competencies, and patterns of behaviour that determine the commitment to and the style and proficiency of an organisation's health and safety management.

### B. Major Causes Of Accidents

According to the bureau of labour statistics, construction work is the second most dangerous occupation in Connecticut. Employees are entitled to protection from hazards and potential accidents. There

are several common causes of construction site accidents, and if you are considering hiring a personal injury lawyer, make sure they understand these causes and how to deal with them in a claim. There are thousands of construction sites.

Here are some of the common major causes of these injuries:

1. Slip and falls, often caused by unsafe working conditions.
2. Falling on stairwells, when stairs are installed incorrectly or there are not handrails.
3. Stepladders, which can tip over collapse.
4. Fall from roofs, when no fall protection or lifelines are provided.
5. Failure to follow state regulations for scaffolding, which can collapse.
6. Trenches and excavation walls collapsing when not installed correctly.
7. Power tool accidents.
8. Dump trucks, forklifts, and other vehicles.

### C. Scope of This Study

The environmental health and safety management system provides the framework for managing environmental issues and activity throughout the project and will ensure roles and responsibilities, sound risk management, decision making, systematic approach to critical safety activities and ensures continuous improvement. It is aimed to establish certain performance expectations. The environmental health and safety management system has been designed to improve the existing level of operational activity.

## II. LITERATURE SURVEY

### A. Factors affecting safety performance on construction sites

Edwin Sawachaetal,(1999)studied the impacts of the historical, economical, psychological, technical, procedural, organizational and the environmental issues are considered the historical factor is assessed by the background and characteristics of the individual, such as age and experience. The economic factor is determined by the momentary values which are associated with safety such as, hazard pay.

**B. Construction job safety analysis**

Ophirrozfeld et al (2009) studied of identifying and assessing the hazards risk is an essential step in safety management. Construction projects are dynamic and they are influenced by many factors such as frequent work rotation, exposure to weather condition, high proportion of unskilled and temporary workers. Job safety analysis is also known as job safety job hazard analysis, is an effective proactive measure for safety risk assessment used in construction industry.

**C. Situation Awareness Approach to construction safety management**

MasoudGheisari et al,(2010) studied situation awareness (SA) improves decision making and performance in complex, situations. Situational awareness has not been considered as a potential method of improving jobsite safety in construction. The purpose of this study is to improve a conceptual model of situation awareness in construction safety management and to improve safety managers' decision making processes.

**III. METHODOLOGY**

The following flowchart figure 3.1 indicates methodology adopted for the project

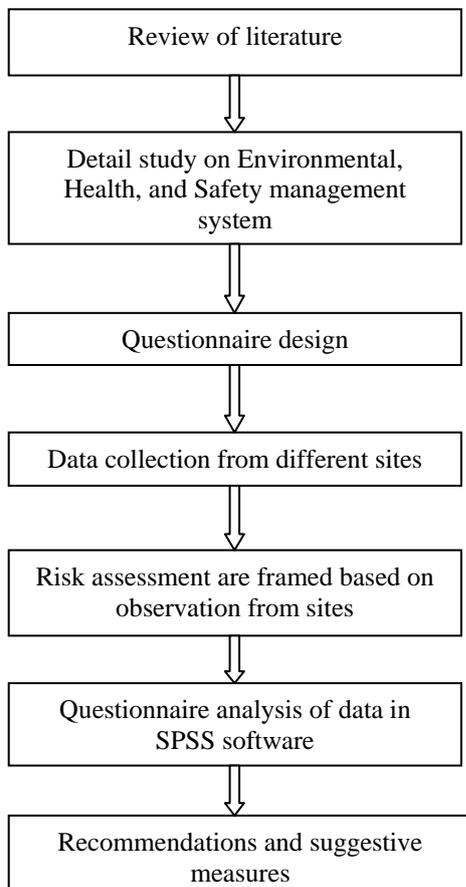


Figure 3.1 Flow Chart of methodology

**A. Risk Assessment Matrix**

Risk assessment matrix is a matrix used to define various level of risk as the product of harm probability7 categories and harm severity categories risk assessment exists in IS 31000:2009 and code of practice in workplace safety and health regulation.

The vertical axis in figure 3.2 represents increasing likelihood level 1 to 5 of the occurrence. The horizontal axis represents increasing consequences severity levels 1 to 5 causes of harm to people. The level of risk matrix is divided into red, blue and yellow.

		Severity				
		Minor	Moderate	High	Very High	Extreme
		Results in negligible emissions to air, water or land; use of natural resources, significantly reduced	Results in well controlled & minimal emissions to air, water or land; use of natural resources reduced by conservation measures	Results in controlled emissions to air, water or land; use of natural resources not controlled	Results in uncontrolled emissions to air, water or land; significant use of energy, water, natural resources	Results in severe ecological damage; large scale use of nonrenewable energy, water, natural resources
Likelihood		1	2	3	4	5
Limited	Impact not expected at this site; control in place to minimize impact;	Low	Medium	High	Very High	Extreme
Possible	Impact not expected at this site, but could still occur;					
Occasional	Impact can occur at a frequency not more than once in a year					
Periodic	Impact can occur at regular intervals; once in a month					
Routine	Impact can occur through everyday operations;					

Figure3.2 Risk assessment matrix

**IV. FACTORS IDENTIFIED ON ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT SYSTEM**

**A. Identification:** The organisational shall identified (based on document procedures) the environmental aspects (that can be controlled and are within the influence of organization) of its activities, products, services.

**B. Categorisation:** The organisation can determine those aspects that have significant impact on environment.

**C. Recognition:** While identifying environment aspects emission to air. Release to water and land, use of raw materials, use of natural resources and non renewable resources.

The major hazard factors identified in the commercial and industrial projects are

- Air pollution
- Water pollution
- Noise pollution
- Electrical
- Scaffolding
- excavation

**V. ANALYSIS AND DISCUSSION**

The questionnaire survey about environmental health and safety management system are collected from the following construction companies

**Table 1 Site and location**

SI.NO	Name of the company	Location
1	L&T construction	Ariyalur
2	Bharath construction	Trichy
3	Ramalingam construction	Tirupur
4	Shoba builders	Trichy
5	Annai builders	Ariyalur
6	K.S.Venkatraman builders	Chennai
7	Shark promoters	Trichy
8	Ark construction Pvt.Ltd	Trichy
9	Chola construction	Trichy

**A. Assess Probability**

- Consider frequency, duration, number exposed, etc.
- Relate to an interval such as time, units produced etc
- Categories  
 Frequent: Likely to occur repeatedly  
 Probable: Occurs several times  
 Occasional: Occurs intermittently  
 Remote: Could occur, but rare  
 Improbable: Will not occur

**B. Benefits of Risk Assessment**

- Effectively utilizes limited resources.
- Allows for prioritization of risks.
- Allows non risk experts to quickly review exposure risks of new operations.
- Provides a transparent method of evaluation and control recommendations.
- Globally, allows risk determinations where otherwise would not exist.

**VI. RESULT AND CONCLUSION**

The conclusion of the study intended to give a health and safety work environment for all labours to do their work and responsibilities by reducing the possibilities of accident impacts. Learning from mistakes and errors from the work environment should embraced by all labours. Therefore aware of risky

**C. Hard analysis and control measures**

Risk is the product of hazard and exposure. Thus, risk can be reduced by controlling or eliminating the hazard or by reducing workers exposure to hazards.

**Table 2 Hazard analysis and control measures**

source	Assessment of hazard	Protection
IMPACT- Chipping, grinding, masonry work, woodworking, sawing, drilling, etc.	Flying fragments, objects, large chips, particles, sand, dirt, etc	Goggles, face shields for severe exposure use face shield.
HEAT-Pouring, casting, furnace operations, hot dipping and welding.	hot sparks splash from molten metals high temperature exposure	Face shield over goggles. Screen/refle ctive face shields
DUST- Woodworking, buffing, general dust conditions	Nuisance dust	Goggles, eyecup and cover types.
NOISE-batching plant, earth moving equipment.	Concrete mixer, vehicles sound	Regular maintanceof engine earthmoving vehicle shall be maintained to control emission to air.

hazard and proper training about safety and personal protective equipment must be provided to improve the safety.

- i. Environmental health and safety management system are observed and studied through questionnaire survey from various construction sites.
- ii. Existing environmental health and safety aspects of workers are analysed as well as recommendation are provided to improve it.

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